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Original

Visione sostenibile (Sustainable Vision in the Conservation of Cultural Heritage Project) / Marotta, Anna. - ELETTRONICO. - (2013), pp. 1210-1219. (Intervento presentato al convegno HERITAGE ARCHITECTURE LANDESIGN focus on CONSERVATION REGENERATION INNOVATION. Le vie dei Mercanti - XI Forum Internazionale di Studi tenutosi a Aversa/Capri nel 13-15 giugno 2013).

Availability:

This version is available at: 11583/2510895 since:

Publisher:

La Scuola di Pitagora Editore

Published

DOI:

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Visione sostenibile (Sustainable vision in the conservation of cultural heritage project)

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Abstract

"Who less sees, thinks nothing" in four words Filippo Juvarra emphasizes the close link between visual culture and architecture theory and practices. In this perspective, what meaning can be attributed (by designers or users), to their "own" architecture and their "own" city? Considering the landscape as a heritage to be safeguarded (according to the Europe Council, the landscape is "perceived territory"), new plants for renewable energy "with environmentally sustainable technology" are sustainable also from the point of view of visual consistency, and therefore of the "sustainable vision"? We are all ecologists and believe in eco-sustainability, but we have to take into account also the "sustainable vision" issue, that is managed by formally coherent and congruent actions in the architecture and landscape between text and context in all scales?. The same inconsistencies can be detected for new integrations (or recovery projects) in the historical structure of the city, which is characterized by specific aspects concerning what we might legitimately define its "visual structure". Similar problems can be finally found when the same visual characters are not analyzed, studied, acknowledged and valued appropriately within restoration and-or conservation projects, both in architectural dimension as well as in the urban one. A careful analysis of these phenomena - disciplinary identified - will avoid that such inconsistencies may exacerbate the increasingly diffused "cultural loss". In support of this thesis will be mentioned, within a large series of case studies being analyzed, national and international examples, both positively and negatively.

Keywords: sustainability, architecture, landscape

1. Sustainability

Bio-architecture, "green architecture" or environmentally friendly, as well as renewable energy, can be considered variations of the same concept, from the common root "green" in order to contain resources and energy, according to the recalled – on an empirical basis – by Hastings S.R, Wines J., Woolley T. [11] [1] [2] [14] [15] [5].

An energy consumed (and all it contains) in the production of materials and components or in carrying out basic functions such as temperature control; or as the "intrinsic"; or in the distribution and transport of materials and components to the construction site ("gray" energy); or even in managing of machinery and systems building and its inhabitants ("operational" energy). Not be forgotten other requirements, such as the ease of recycling of materials and the amount of the same effectively used by building. Despite the considerable progress in the introduction of measures for energy saving, some processes have slowed and sometimes hindered this trend. The capital required to invest in new equipment and procedures with high energy efficiency is often not easily available; measures to reduce waste and pollution (which have a higher legislative value of regulations to encourage monitoring of energy use) sometimes imply (contradicting the theoretical premises) an increase in energy consumption. Such as in some areas with "refined" productions: glass, composite and curtain wall. [9] [24] [13] [8].

1.1 Visual parameters in sustainable project.

Considering the building in its entirety, as well as can be conceived, designed and managed to ensure maximum energy efficiency, including renewable sources, the term "passive" appears misleading. The house passive solar or bio-climatic, to cite one case, there isn't an inert set of materials and

components: in fact it must have, or at least imitate, the constituent parts of an organism, capable of constant adaptations. Saw that the building depends on the exploitation of positive climatic factors, must also be able to react to their mutations.

Basically, "regulate" adjust the casing means that about a quarter of the wall surface of the building must be opened and closed, a third party must be able to let in natural light without hindrance and a similar surface must allow the solar radiation to enter at certain times and screen in other time. In addition, the casing must be designed to do all this without interfering with the ability to look outside. The new importance given to the casing respect to its general structure provided additional stimuli to the architectural expression of the facade and the coverage, elements that were previously confused - respectively - by the indifference of the curtain wall and the necessity to fit under cover implants, triggering even innovative forces in the industrial strategies. The production (for example) of the glass with "sustainable" characteristics has reached results which allow not only the visibility, but also the thermal insulation, the solar control and the spontaneous regulation between different modes of dimming [20] [26] [23] [16]. Innovative topics related to sustainability, are confirmed in the graft on the more traditional relationship between architectural project and its context: Steven Holl in defining an "anchor" the dynamic relationship that is established between the built and the site, considers foundation of the "concept": the resolution of the respective functional aspects, views and opening visuals, the circulation and access are "necessary physical to the metaphysics of architecture" [4]. In La Jolla, California (for example) at the Salk Institute of Louis Kahn (1959-1965), at a time of day the sun reverberating in the ocean, merges with the light reflected into the water of the moat that separates the central courtyard, while the functional and physical requirements blend with the visual character of the place.

So, in general, among the broader aspects of objective and individual comfort, along with data and objective standards, should be considered as perceptual, variables in the course of the seasons, the day, the users. Outside of specialist and disciplinary treatments, a possible definition of comfort could be a "no hassle" without forgetting the psychological well-being. But in the parameters to measure such comfort, is also included the visual one, according to the theoretical (for example) from Maslow? We can therefore talk - within the architectural / environmental sustainable system - even "sustainable vision", a visual input (perceptual and cognitive) acceptable and congruent of new environmentally friendly technologies and methodologies respect to the context? And this can be achieved with their methodological approaches, disciplinary and specialist? Or these discrepancies (as in the case of wind turbines, or "coat" linings) are a price "aesthetic" to be paid in the name of an "healthier" ecosystem?

2. Sustainable color

Inside of the problems outlined above, the chromatic themes arise with particular force and complexity: from the middle of the last century the tendency to color reborn through a number of objectives: to conflict with or accommodate the architecture (local or not); enhance or camouflage material construction, enhance or manipulate the volumes, or to emphasize the characteristic features of the building, such as the Centre Pompidou in Paris in which the building by Renzo Piano and Richard Rogers is inserted as a single volume in the variety of "Grey Parisian" adopting the typical colors of the technological information systems.

In the design phase, the set of conditions relative to the levels of building system adequate to health and the conduct of activities of the users can be connected to the use of color to enhance the sustainability of buildings. In particular it will be the need for thermohygrometric comfort, combined with the recommendation of climatic resource utilization, one in which the color will better contribute to the improvement of performance through a careful choice of materials, but also the coloring of surfaces, systems and technical systems and its exposure to the sun. The reaction / reflection that follows must therefore take into account, in an area predominantly constructive and architectural, the role of the color of the buildings especially with regard to the choice of materials or decorations, keeping in mind the characteristics for a sustainable color of natural light and artificial which (with its different intensity and with that brought from the shadows) will cause effects on items particularly charismatic and determinants, such as to greatly exceed the level of the single formal and "objective" image. The choice of building materials is also another important factor where the color can even more help to improve the environmental sustainability, not only individually building but also in the areas of reference (UNI 0050) [12] [22] [3] [18]. Has been widely demonstrated that in the phenomenology of color the physical definition "objective" is to be combined with aspects perceptive and subjective: when an object or a material is in our daily surroundings, its color just does not seem to change if it is to illuminate the sunlight or the light of a candle. For example, observing the snow at night we would be ready to affirm that this is white in color, even if the light radiation that comes to our eye is not at all. In this case it is our brain that deceives us by making a sharp correction on physiological data. But this trick enables us to live with greater security and mastery the environment around us [28].

2.1 Sustainable vision of new material

Among the new generation products, there is (among many others) colored glass, to continue the tradition of those mass-coloured: thanks to a chromatic "interlayer" in PVB. The interlayer, an integrated component of laminated glass, featuring a new generation of films for the manufacture of laminated glass for building, decorative, high technology and which opens the door to a new way of interpreting and using color in internal and external design. The range of products of interlayers is the versatile response to the growing needs of design with glass and to the market changing. The system is made up of eleven primary colors from which you can generate more than a thousand tones transparent, translucent and opaque. The maximum size of production is directed generally to the size of the autoclave for the production of laminated glass: 2.00 x 7.00 meters or 2.60 x 4.60 meters. Interlayers provide the benefits commonly associated to laminated glass, widely used in construction: sunscreen, it can absorb up to 99% of harmful UV rays, resistance and therefore safety, as well as significant reduction in the transmission of noise in indoor environments. Staining of the color interlayers is based on shades of red, yellow, blue, black and white and can be stacked offering a full range of colors, from neutral and relaxing white and browns to lively and gaudy violet and orange. It will therefore be the color of the glass that you want to obtain to determine which interlayer chromatic must be privileged. The reproducibility of the color of the intervals is directly related to the gradient obtained from the mixers and the light transmission of each same interlayer. To get a specific shade, many configurations require asymmetrical compositions of interlayers. The perceived color may be different depending on the mode of observation, especially when the colors were examined by reflection [21] [7] [6].

3. Positive and negative examples

With figures like Richard Rogers, Norman Foster and Renzo Piano, in recent years the most advanced hi-tech movement has joined both the "green manifest" that his architectural vocabulary: on this trail, there are many positive examples made in the field of sustainable: the first selected here is the asylum "Els Colors" in Barcelona [Fig.1 and Fig.2], follow the Kilometro Rosso by Jean Nouvel [Fig.3 and Fig.4], the Centropadane Bridge in Brescia enlightened by Philips [Fig.5] and the Water Tower near the Farini Bridge at Porta Garibaldi Rail Station, Milan [Fig.6] in the new redesign.

Among the negative examples, carriers of problems and issues at stake, you can cite instead the wind farm in the Natural Park of Adelasia in Liguria [Fig.7] or the example of the thermal analysis of the housing stock held in San Lorenzo di Greve, Florence [Fig.8].

3.1 The "Els Colors" Kindergarten [Figg. 1 e 2]

Reassuring entertaining and educational spaces of nurseries and pre-schools are affected by the configuration of objects and places, but also by the colors with which children are having to interact daily. Generally environments asylum, both external and internal, their furnishings and finishes, provide a quality range of colors, materials and light large enough to activate sensory stimuli of various kinds. In particular, the colors affect the learning and development of children: the pink glaze is definitely more suitable for creating a magical atmosphere, instilling safety as a family environment and leading to the discovery of the surrounding environment; the shades of tenuous light blue, however, help the older children to internalize those experiences in early childhood, facilitating the assimilation of information and understanding of the same. The search for a combination of formal and perceptual quality and technological quality of the project seems to resolve himself in "Els Colors" kindergarten, designed by RCR Arquitectes in the outskirts of Barcelona [17] [27], in juxtaposition between the use of color as characterization spatial technique typical of school building and the creative use of color interlayers inside the laminated glass. The architecture of this nursery is characterized by the simplicity of the composition obtained from a planimetric structure of high linearity: two longitudinal buildings with a marked horizontal development, house the classrooms, spaces for socializing and dining, connected to each other in transverse with a covered walkway, access in turn also to the inner courtyard; a higher volume is positioned above the main entrance and is used as a multifunctional space. The project has been developed thinking to the different perception of space that have children and the fact that their point of view originates lower than that of an adult. The extensive use of bright colors (with hot / cold contrasting), yellow-green, orange, red and blue, coatings and glass walls of the classrooms allows to enrich the perception of children and direct them to the knowledge of complex relationships, interpreting spatial and perceptual differences suggested and also induced by the transparency and opacity of materials. A shade of green unifies interior linoleum flooring and the external in synthetic carpet, proposing on the horizontal plane the same visual continuity that windows ensure vertically. From a technical point of view, appears to be fundamental the choice of safety glass, given the proximity of the children to the panels. The color interlayers leads to a varied coloring, providing an ideal level of safety for cases, due to the excellent adhesion to glass and high elasticity, which allows an effective absorption of the energy impact. From

the point of view of the sustainability of buildings, the use of solar control glass, or sunscreen, has allowed to obtain a considerable energy saving for the air conditioning improving the indoor comfort due to a greater control of the temperature and brightness [25].

3.2 The "Kilometro Rosso" [Figg. 3, 4 e 5]

"For me there are only three colors: black, theoric gray(which we call neutral) and white. Other colors are mere nuances ". [10] Black is the color of the secret and pain, which absorbs and returns every light, every reflection. It is often combined with gold, red and electric blue to create theatrical effects, which emphasize the taste of the performance of the architecture of Nouvel. Black, gloomy during the day, comes alive with color at night, through lights flickering that remind lighthouses, which become points of reference for the viewer that is situated to admire the built. The power of light today it has become almost an obsession for Jean Nouvel. According to him, those who love light, like also its opposite, that is, its shades and fade away into the darkness, through a path of shadows that transform the distances in illusions [19], while its production is similar to a complex optical machine, more important for effects it produces than for their physical substance. This philosophy can be found confirmed in the realization of the "Kilometro Rosso", the first Italian opera of the French architect: an installation in the lombard landscape , located between the municipalities of Bergamo and Stezzano. The project is intended to be, within the Science and Technology Park, a sustainable last generation building. The main objective is the creation of environmentally friendly architecture as a symbol of sustainable development, innovation and research, ie an active role in the development of the entire territorial system in the respect for the environment, for the best quality of life. Nouvel use the wall as a real wall system, which "hang" the new architectures that complete the equipment of the Park, a place that is home to companies, research centers, laboratories and activities of hi-tech production. As for color choices, "Daniel Thompson considers the synthesis of vermilion as the most important technological innovation in medieval painting: there is no scientific invention has had a vast and lasting impact on the practice of painting, since the invention of this color, as if the Middle Ages had not owned this bright red, could hardly develop its high standard of color, and there would be less need to find other bright colors that appear on the scene from the twelfth century onwards. Was certainly the medieval prince of red» [17].

The wall / barrier, who is also the very important role of filter between the A4 and the Park that extends to the back of the barrier, is coated in red extruded aluminum; _ is just one kilometer long and a height of ten meters. The imposing red backdrop born of the water, rises, takes thickness and is deflected. Almost as if something huge was leaking from the highway and struck him. Then, plastically, falls and continues to run, ending its stroke after a thousand meters. The attention of the passer is certainly affected, arousing a feeling of curiosity, but the deciphering of the product itself is not easy to grasp, unless it is to stop to observe, penetrating inside. The red color , recently "rediscovered" by the designer, symbolizes strength, dynamism borrowed from the coordinate image of the new Center for R & D Brembo (manufacturer of braking systems for Ferrari). The red acquires a symbolic value, due to the client company, as well as functional appeal to its target of attention, due to the specific characteristics of the color. The same meaning is conveyed from the wall: this in fact is always the first step that moves the architecture: is what defines a space, defends and locks him scoring an inside and an outside. The perception of the architectural complex also imposes as an icon for motorists who travel the highway that passes by; but at the same time, the "Kilometro Rosso" is a protective shell for activities that are located within the park that extends over its structure.

4. Conclusions

In the project and sustainable yard, to avoid the rigidity of formal technology solutions that are likely to be highly repetitive, monotonous and serial proves fundamental the research and formal experimentation, without excluding the utility of theories of color and the vision, applied to sustainable project. And the same is true for studies aimed at a "sustainable vision" in deepen and develop in symbolic values mentioned in one dimension genuinely multicultural and inclusive. Thus understood, visual culture is the consequent - more pragmatic - experience of phenomena and visual characters not only be antithetical technological and constructive approach, but it will be an indispensable completion.



Fig. 1: The interior elevation of asylum that overlooks on the courtyard, used as a recreation area for children. From a technical point of view appears to be _ fundamental the choice of safety glass, due to the proximity of the children to the panels . Colored PVB interlayers provide an ideal level of safety for cases, due to the excellent adhesion to glass and high elasticity, which allows for an effective energy-absorbing shock. (In AA.VV. *Asilo Els Colors*, The Plan, n. 15, luglio/agosto 2006, p. 63).



Fig. 2: Focus on the reflective properties of the glass used, typical of multilayer glass with PVB interlayer plastic. Through this reflection, the building is fully embedded into context, reflecting the conformation. The importance of color in the relationship between man and the environment becomes therefore essential for the construction of a psychological climate for the function that is in charge of the place itself. (In AA.VV. *Asilo Els Colors*, The Plan, n. 15, luglio/agosto 2006, p. 68).



Fig. 3: The Kilometro Rosso seen from the A4 highway. Despite the cars slide quickly down the stretch of road, _ perception of the building is guaranteed by its color. The Kilometro Rosso is the first Italian work of the French architect Jean Nouvel; the barrier, which acts as a filter between the highway and the park, is covered extruded aluminum and is just one kilometer long and has an height of 10 meters (da <http://www.kilometrorosso.com>).



Fig. 4: Night view of Kilometro Rosso from the A4 highway, with the illumination of red. At perceptual level the wall is imposed as an icon for drivers who travel that stretch of highway. The imposing red backdrop seems to be born of water, rise, take thickness and inflect (da <http://www.kilometrorosso.com>).



Fig. 5: Centropadane Bridge near Brescia. The lighting design of the bridge is made entirely with LED products, because this technology enables highly dynamic nature and the ability to configure different scenes in an elastic way (da http://www.lighting.philips.it/projects/italian_projects/ponte_centropadane.wpd).



Fig. 6: Water tower near the Farini Bridge at Porta Garibaldi Rail Station, Milan in the new restyling. Restored for the FIFA Football World Cup "Italia'90", the coating is composed by ceramic tiles. (Image from www.panoramio.com).



Fig. 7: 2004, Natural reserve of Adelasia, Liguria. Photo by Filippo Serafini.

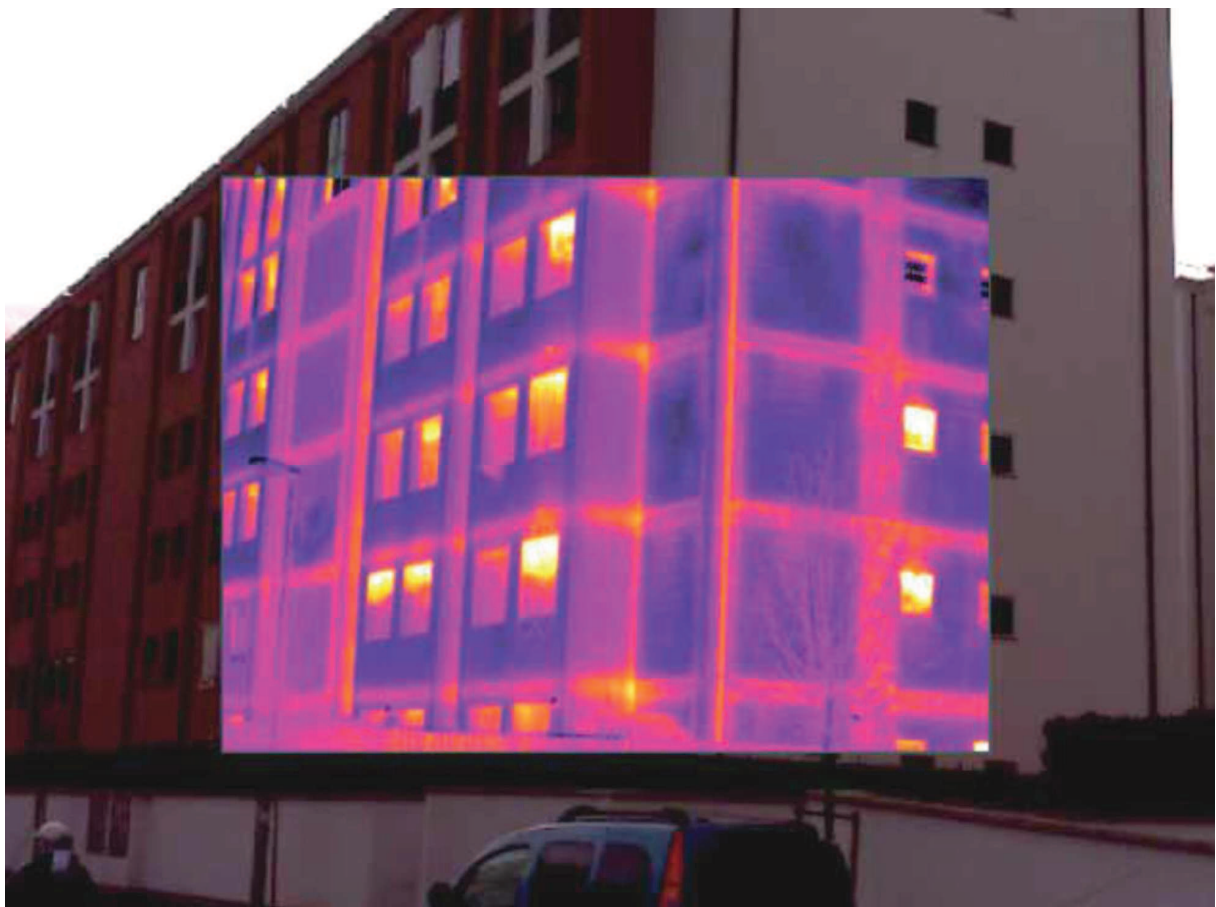


Fig. 8: Firenze, San Lorenzo a Greve, via Tiziano, year 2010. Thermographic analysis of the housing stock for the Italian Legambiente campaign on energy efficiency in buildings (da http://www.legambiente.it/sites/default/files/docs/tuttiinclassaper_sito.pdf).

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